Consistency of transverse energy spectra at SPS?*

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The transverse energy distributions in different systems at SPS energies have been calculated with the Ultrarelativistic Quantum Molecular Dynamics, UrQMD, model [1]. The results for S(200 GeV)+Au and Pb(160 GeV)+Pb collisions within the pseudorapidity range $2.1 < \eta < 3.4$ are in good overall agreement with data from the NA35 and NA49 collaborations [2].

The hard collision spectrum of neutral E_T for Pb(160 GeV)+Pb and S(200 GeV)+U reactions has also been calculated. First, the number of hard nucleon-nucleon collisions, proportional to the yield of Drell-Yan muon pairs, is determined microscopically in the simulation of freely streaming nucleons. The associated simulation of all soft processes with the full hadronic cascade, initialized at the same impact parameter b, then renders the information about the produced transverse energy. Figure 1 shows the results. Experimental data from NA50 [3] are shown as well, however, with a rescaled abscissa (by 0.8), since the most recently published data [4] indicate an absolute shift of the E_T values as compared to previous publications on Pb+Pb collisions [3]. We compared the $E_T - E_{ZDC}$ contour plots from 1997 [3] and 1998 [3]. The UrQMD simulation seems to be in rough agreement with the rescaled dN/dE_T spectrum. Hoewever, the agreement between model and experiment (NA38) [5] becomes poor in the asymmetric S+U reactions although the calculated S+Au E_T spectrum agrees well with the NA35 data.

According to our simulations, the NA38 neutral E_T spectrum of S(200 GeV)+U is not consistent with the transverse energy spectrum of S(200 GeV)+Au, measured by NA35. On the other hand, the (rescaled) NA50 Pb+Pb spectrum seems to be consistent with the NA49 and the NA35 spectrum. Given the consistency of the microscopic simulation with three different experimental measurements we assign the remaining discrepancy in S+U to an imperfect determination of the NA38 E_T scale.

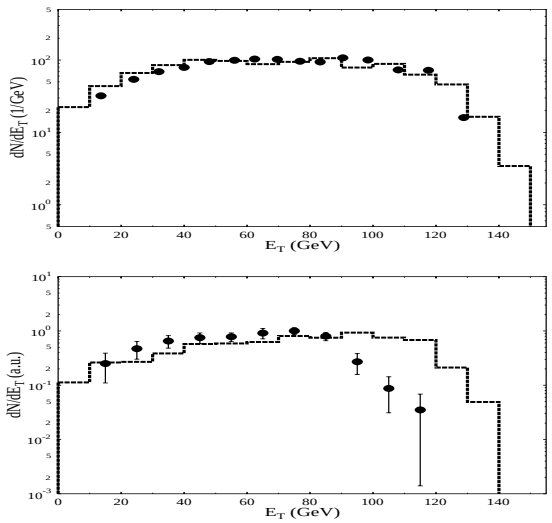

Figure 1: Top: Number of Drell-Yan muon pairs in Pb+Pb as a function of the produced neutral transverse energy within $1.1 < \eta < 2.3$. The UrQMD result is shown with the rescaled NA50 data [3]. Bottom: Same for S+U within $1.7 < \eta < 4.1$ compared to NA38 data [5].

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